NON-PHARMACOLOGICAL INTERVENTION TO INCREASE QUALITY OF SLEEP ON THE ELDERLY: A SYSTEMATIC REVIEW

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ABSTRACT

Introduction: Sleep disorders are common health problems reported 39-75% of the elderly. The presence of sleep disorders in the elderly can lead to poor sleep quality in the elderly. Pharmacological action in treating sleep disorder continuously will produce unwanted side effects. Non-pharmacological action lately becomes a crucial issue in the nursing environment in overcoming sleep disorders. **Method:** The source of article used is obtained from a search through the database Proquest, EBSCO, Google Scholar, Scopus, SAGE, and Science Direct. Search restricted articles ranging from 2008 until 2016. After the articles obtained, then research articles were extended of making systematic review. **Result:** Systematic review resulted 11 of the 13 non-pharmacological intervention options that can be used to improve the quality of sleep on elderly, in example of acupressure, SSBM, ling tien kung therapy, baduanjin exercise, exercise training program, gymnastics for elderly, practice of progressive muscle relaxation, tai chi, sittercise, aerobic exercise, and aquatic exercise. **Conclusion:** Non-pharmacological Intervention is part of secondary prevention that can be done to improve sleep quality on the elderly.

Keywords: non-pharmacological intervention, quality of sleep, elderly

INTRODUCTION

Sleep disorders are common health problems reported 39-75% of elderly (Blay, S.L., Baxter, U.S., Leite, G.F., 2008). This is in line with the statement of Roland (2011) who says that the aging process makes the elderly more susceptible to sleep disturbances, besides resulting in normal changes in sleep and rest patterns of the elderly. The presence of sleep disorders on the elderly can lead to poor sleep quality on the elderly (Su, T.P., Huang, S.R., Chou, P., 2004). Sagala (2011) stated that the quality of sleep is the satisfaction of a person to sleep, so that someone does not show feelings of fatigue, easily aroused and agitated, lethargic and apathetic, black around on the eyes, swollen eyelids, red conjunctiva, sore eyes, fragmented attention, headache and frequent yawning or drowsy. Sumedi, T., Wahyudi, Kuswati A. (2010) revealed that the quality of nighttime sleep on the elderly decreased to approximately 70-80% of the adult. Factors that could cause poor sleep quality on the elderly are the response to disease, depression, anxiety, physical environment, and lifestyle (Silvanasari, 2013).

Guyton & Hall (2007) stated that individual sleep quality can be analyzed by electroencephalography (EEG). Buysse et.al. (1988) also suggests measuring instrument to the quality of sleep by Pittsburgh Sleep Quality Index (PSQI). PSQI provide a quantitative measure of the quality of sleep that fast in identifying sleep quality is good or bad, and better than the gold standard of clinical and laboratory diagnosis. PSQI score <5 indicates a sensitive and specific measure of sleep quality is good on the individual. The higher PSQI global score obtained the worse also the individual sleep quality (D.J. Buysse, Reynolds C.F., T.H. Monk, Berman S.R., and D.J. Kupfer, 1988).

Nurses, both in the clinical or community, have an important role in improving the quality of sleep on elderly.

Nurses can perform preventive measures in dealing with sleep disorders on the elderly, which includes primary prevention, secondary, and tertiary. Primary prevention is an attempt to avoid specific diseases or health conditions. Health education about good sleep hygiene can be done as primary prevention form of poor sleep quality. Secondary prevention is early detection and treatment of adverse health conditions, including non-pharmacological and pharmacological actions. Tertiary prevention is done if certain conditions or diseases may have caused damage to the individual (Anderson & McFarlane, 2006; Stanley & Beare, 2006).

Individuals with insomnia usually get treatment to improve the quality of sleep, but the action of pharmacology in overcoming sleep disorders are constantly certainly will produce side effects that are not desired (Bertisch, Herzig, Winkelman, Buettner, 2014; DeMartinis, Kamath, Winokur, 2009). Non-pharmacological action in treating sleep disorder lately becomes a crucial issue in the nursing environment (Su et al., 2013). Various studies of non-pharmacological intervention in an effort to improve sleep quality on the elderly have been published, such as acupressure, music therapy, exercise, and so on. The purpose of this study was to evaluate the effectiveness of non-pharmacological interventions in improving sleep quality in the elderly.

METHODS

The Journal Search Strategy

The approach used was the approach of systematic review that began with the selection of a topic, then the specified keywords to search journals (primary research) using English and Indonesian through several databases, among Proquest, EBSCO, Google Scholar, Scopus, SAGE, and Science Direct. This search was restricted from 2008 until 2016. Keywords in English used were "nursing intervention", "non-pharmacology", "sleep quality", and "elderly". Indonesian Language used the keywords of "intervensi keperawatan", "intervensi nonfarmakologik", "kualitas tidur", "lansia", dan "lanjut usia".

Journal Selection

Articles were selected for review based on studies carried out in accordance with the inclusion criterion. The criterion for inclusion in this systematic review is the application of non-pharmacological nursing intervention. The journal is a primary research, research design can be using Random Controlled Trial (RCT) or quasi-experiment, the participants were elderly people with sleep problems such as insomnia and poor sleep quality, as well as the measurement can be subjectively the form of the Pittsburgh Sleep Quality Index (PSQI) and the scale of insomnia and objective in such polysomnography or actigraph form.

Titles and abstracts of the search results then screened by investigators, could be included into the inclusion criteria or not. Researchers read the full text of paper that exists when researchers difficulty in deciding the journal suitable or not with the existing inclusion criteria. Search using keywords above found 61 articles. Of the entire articles, which met the inclusion criteria were 17 articles.

RESULTS

Characteristics

The results in reviewing 17 research articles that met the inclusion criteria, got 13 types of non-pharmacological interventions, namely practice of progressive muscle relaxation, gymnastics for elderly, tai chi, aerobic exercise and resistance exercise, aquatic exercise, baduanjin exercise, walking, exercise training program, ling tien kung therapy, slow stroke back massage, music therapy, sittercise, and acupressure. Four studies tested more than once, which were progressive muscle relaxation exercises, elderly gymnastics, tai chi, and music therapy.

Setting of the 17 articles of research was in the community (n = 13), laboratory (n = 2), and home care (n = 1). The number of samples was ranging from the smallest of 20 people to the largest number of 126 people. Most interventions more directed to an exercise activity given to the elderly with poor sleep quality or elderly people with sleep disorders. Most studies also did not explain in detail how the procedures related to the interventions, the researchers simply wrote down how long that given interventions.

Measuring instruments used on the rest of the articles in the form of an objective measurement tool (polysomnography, actygraph) as many as four researches and measurement tools that were subjective (PSQI, Korean sleep scale, and insomnia rating scale) of 13 studies. The parameters used appropriate criteria for inclusion that were to measure the quality of sleep, insomnia, and other sleep disorders in the elderly.

The results on 17 research articles were reviewed, there were seven research articles that used quasi-experiment, in which the intervention given that sittercise, gymnastics elderly (n = 2), practice of progressive muscle relaxation (n = 2), acupressure, and ling tien kung therapy. Ten RCT research approached with the rest of intervention options that music therapy (n = 2), aquatic exercise, aerobic exercise, baduanjin exercise, home-based walking, exercise training program, SSBM, and tai chi (n = 2). When viewed in terms of the selection method, in accordance with the level of evidence, of course, research method approached, RCT was more general than the study design of quasi-experiment.

Non-pharmacological intervention effect on the sleep quality of elderly

Non-pharmacological interventions to improve sleep quality on the elderly were very various, which there were 13 kinds of intervention options from 17 articles were obtained. Type of non-pharmacological interventions were practice of progressive muscle relaxation, gymnastics for elderly, tai chi, aerobic exercise and resistance exercise, aquatic exercise, baduanjin exercise, walking, exercise training program, ling tien kung therapy, slow stroke back massage, music therapy, sittercise, and acupressure. The time required of each intervention also different, ranging from 1-16 weeks. Frequency of intervention was also different which ranges from every day made up until only once in a week.

Non-pharmacological intervention form of acupressure is applied for 5 minutes on each point, once to twice daily (before the break of day and night) for 4 weeks can improve sleep quality in older adults with hypertension (LW Zheng, Chen Y., Chen F., P. Zhang, Wu LF, 2014). Slow-Stroke Back Massage (SSBM) for 3 minutes of bedtime can overcome sleep disorders and dementia in the care homes (Harris M., Richards K.C, V.T. Grando, 2012). In contrast to these two studies, two studies using music as an intervention would indicate no significant difference between the treatment group and the control group. Giving music may be effective as promoting sleep (M.F. Chan, Chan E.A., E. Mok, 2010; Lai H.L, et al, 2015).

Non-pharmacological intervention form of exercise is various in types. Kung tien ling therapy can improve the quality of sleep of elderly with treatment for 6 weeks. Chen M.C., H.E. Liu, Huang H.Y., Chiou A.F. (2012) explains that baduanjin exercise can improve sleep quality of the elderly after 12 weeks of intervention. Exercise training program can also improve the quality of sleep of elderly with heart failure (Suna, Jessica M., et. Al., 2015). Giving elderly gymnastics for 1 week may improve the quality of sleep of elderly (Yurintika F., F. Sabrian, Dewi Y.I, 2015; Cahyono H.K., 2012). Progressive muscle relaxation exercise can improve sleep quality and reduce the level of insomnia in the elderly (Sulidah, Yamin A., Susanti R.D., 2016). Tai chi is done and given a maximum of 40 minutes 3 times a week for

16 weeks can improve sleep quality in the elderly. Other studies have produced evidence if tai chi which is done every week for two months may improve sleep quality in older adults with cognitive impairment (Irwin M.R, R. Olmstead, Motivala S.J., 2008; Chan, et al., 2016). Sittercise performed 3 times a week for 8 weeks resulted in significant positive results on the quality of sleep (Lee M: S, Kim S.R., Min G.H., Cho B.J., 2015). Aerobic exercise is done alone or in combination with resistance exercise is effective in improving sleep quality in the elderly after 10 weeks (Bonardi, J.M.T., et.al., 2016). Unlike the case with the exercise study, research conducted by Chen L.J, Fox K.R., P.W. Ku, Chang Y.W. (2016) actually get results that aquatic exercise can only lead to significant differences in sleep latency and sleep efficiency, not on the overall parameters of measuring the quality of sleep and study of home-based walking intervention is not even significant in improving the quality of sleep of elderly (Wenzel, Jennifer A. et. al., 2013).

DISCUSSION

This systematic review provides evidence-based picture of the effectiveness of non-pharmacological interventions related to the improving of sleep quality on the elderly. The results of the reviews explain that there are 11 of the 13 choices of interventions that can be used to improve the quality of sleep of elderly, such as acupressure, SSBM, therapy of ling tien kung, baduanjin exercise, exercise training program, gymnastics elderly, practice of progressive muscle relaxation, tai chi, sittercise, aerobic exercise, and aquatic exercise; although aquatic exercise itself does not show significant results in overall sleep quality measurement parameters. Music therapy and home-based walking intervention showed no significant results in improving the quality of sleep on elderly. From the terms of the duration for the intervention, intervention options of SSBM conducted for 3 minutes bedtime can improve sleep quality of the elderly based on measurements of actigraph data in 48 hours.

The results of this review are certainly useful for nurses, both clinical and community nurses. Nurses can apply one of non-pharmacological intervention as a form of secondary prevention of poor quality sleep and sleep disorders on the elderly. Clinic nurses can do SSBM and acupressure in order to improve the quality of sleep of elderly, while the community nurse can choose exercise to improve sleep quality of the elderly. Application of non-pharmacological intervention can certainly prevent a worse condition in the elderly with poor sleep quality as well as elderly people with sleep disorders.

These studies could not be fully generalized. Bias might occur. It could be due to measurement parameter was not homogeneous and the condition of the study sample were also less homogeneous (there are a few samples with pathological conditions such as tumor, hypertension, and cognitive impairment).

CONCLUSION AND RECOMMENDATION

Conclusion

Non-pharmacological intervention is part of secondary prevention that can be done to improve sleep quality on the elderly. Acupressure, SSBM, kung tien ling therapy, baduanjin exercise, exercise training program, gymnastics elderly, progressive muscle relaxation exercises, tai chi, sittercise, aerobic exercise, and aquatic exercise can be selected non-pharmacological interventions in improving sleep quality of the elderly. SSBM intervention is considered effective if the terms of the duration of the intervention.

Recommendation

Clinic nurses can do SSBM and acupressure in order to improve the quality of sleep of elderly, while the community

nurse can choose exercise to improve sleep quality of the elderly.

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